CLAIMS

1. A computer network, comprising:

a plurality of network appliances that optimize the performance of domains hosted on geographically distributed, mirrored network sites;

a client computer capable running a session to display or change the configuration of said network appliances; and

a network over which said network appliances and said client computer communicate;

wherein said network appliances located at each mirror site work in concert to direct client connections to a network site with the optimal response time to said client.

2. The computer network of Claim 1, wherein said network appliance communicates with each other through an authenticated protocol on top of a communications protocol.

3. The computer network of Claim 1, wherein said network appliance communicates with said client computer through a TCP protocol.

4. The computer network of Claim 1, wherein said client computer runs a secure or insecure Telnet session to display or modify the configuration of said network appliances.

5. A communication method for network appliances comprising the steps of:

constructing a message with a security component by a first network appliance, wherein said message comprises a message header followed by one or more message components, wherein said message header is used to identify message type and protocol version being used, wherein said message components are used for any data said message may contain;

sending said constructed message by said first network appliance;

receiving said message header by a second network appliance, wherein said second network appliance identifies message type and protocol version being used, wherein said second network appliance discards said message if message type is not recognized;

receiving said security component by said second network appliance, wherein said second network appliance verifies said message; and

receiving other message components, wherein any message component not understood by a said second network appliance is skipped, but remaining message components continue to be processed.

6. The method of Claim 5, wherein each said network appliance is configured with one or more security keys.

7. The method of Claim 5, wherein said message contains a hash.

8. The method of Claim 5, wherein said security component contains a key ID.

9. The method of Claim 5, wherein said step of receiving said security component comprises the step of:

verifying said message by computing a hash using a key identified by a key ID included in said security component.

10. The method of Claim 5, wherein if security is disabled on said first network appliance, said security component is ignored by said second network appliance.

11. A process for Internet site selection, comprising the steps of:

sending request for a resource from a domain by a client;

resolving the domain name to the IP address of the first selected Internet appliance in a global domain by DNS, wherein said first selected Internet appliance receives said client's request;

synchronizing by said first Internet appliance through a separate TCP/IP connection with other Internet appliances; and

redirecting said client to the Web site with optimal response time to said client.

12. A process as set forth in claim 11, wherein when said first selected Internet appliance receiving said client's initial request, it first determines which site selection mode has been selected, wherein if a refresh mode or double redirect mode is selected, a client network cache (CNC) is enabled, wherein if a redirect mode is selected, said client network cache (CNC) is disabled because said Internet appliances never learn which local domain had the best response to the client.

13. A method for site selection by routing client request to a optimal server according to claim 11, comprising:

establishing, by said client, TCP connection to a first web site and sending HTTP GET request for a resource from a global domain to a first Internet appliance coupled to said first web site, wherein said global domain is registered in DNS with a unique URL;

forwarding, by said first Internet appliance, an HTTP redirect to other Internet appliances at other Web sites;

sending rely simultaneously by said Internet appliances at all participating Web sites send, wherein the source IP's are spoofed to that of said first Web site, wherein said first Web site's reply is an HTTP redirect to the server IP at said first Web site, wherein each of other Web sites' replies is an HTTP redirect at its own site; and

checking local sites' operability, wherein if said first Web site's server is dead, said first Web site will send a redirect to a server at a different Web site, wherein if said first Web site's server is just slow, said first Web site will send its redirect later to give other Web sites a better chance of winning the footrace.

14. A method for site selection by routing client request to a optimal server according to claim 11, comprising:

establishing, by said client, TCP connection to a first web site and sending HTTP GET request for a resource from a global domain to a first Internet appliance coupled to said first web site, wherein DNS resolves the

domain name to the IP address of said first Internet appliance in said global domain, wherein said global domain is registered in DNS with a unique URL, wherein said first Internet appliance acts as a synchronizing Internet appliance;

returning, by said first Internet appliance, an HTML page with link requests for each member of a group of participating Internet appliances, wherein said HTML page includes a meta tag that causes an HTML refresh command at said client;

requesting, by said client, various images from said Internet appliances specified in said HTML page, wherein said images are small and non-viewable;

returning, by each said Internet appliance, said image data and measuring a Round Trip Time (RTT) between itself and said client during TCP handshaking;

sending, by each said Internet appliance, said RTT data back to said synchronizing Internet appliance, *i.e.,* said first Internet appliance, over inter-box protocol (IBP), wherein said synchronizing Internet appliance updates its Client Network Cache (CNC) with said new RTT data;

executing an HTML refresh by said client upon receipt all of said image data, wherein said refresh causes a repeat of step 1;

selecting, by said synchronizing Internet appliance, a local domain with the lowest RTT, and redirecting said client to the Web site with the lowest RTT, wherein said client finishes a session with said Web; and

sending, by said synchronizing Internet appliance, new client network data to other Internet appliances, wherein each Internet appliance updates its CNC.

15. A method for site selection by routing client request to a optimal server according to claim 11, comprising:

establishing, by said client, TCP connection to a first web site and sending HTTP GET request for a resource from a global domain to a first Internet appliance coupled to said first web site, wherein DNS resolves the domain name to the IP address of said first Internet appliance in said global domain, wherein said global domain is registered in DNS with a unique URL, wherein said first Internet appliance acts as a synchronizing Internet appliance;

proxying, by said synchronizing Internet appliance, connection to original server, and responding with requested content, wherein said synchronizing Internet appliance also inserts image links to other participating Internet appliances;

following, by said client, said links to said other participating Internet appliances and allowing them to determine the Round Trip Times (RTT) to said client, wherein said times are then reported back to said synchronizing Internet appliance over inter-box protocol (IBP);

establishing TCP connection to said synchronizing Internet appliance and sending HTTP GET request; and

directing said client to the optimal site through either DNS or HTTP redirect upon the next request from said client or client network, wherein said Internet appliance at every web site remembers said client's network address.

16. A method for site selection by routing client request to a optimal server according to claim 11, comprising:

establishing, by said client, TCP connection to a first web site and sending HTTP GET request for a resource from a global domain to a first Internet appliance coupled to said first web site, wherein DNS resolves the domain name to the IP address of said first Internet appliance in said global domain, wherein said global domain is registered in DNS with a unique URL, wherein said first Internet appliance acts as a synchronizing Internet appliance;

sending, by said synchronizing Internet appliance, a pre-built redirect message to every participating Internet appliance, including said synchronizing Internet appliance, wherein said pre-built redirect message's local domain URL is included in its domain portion, wherein said local domain URL is a DNS-registered URL for a mirror Web site in said global domain;

overwriting, by each participating Internet appliance, said domain portion with its own local domain URL, and sending the redirect message to said client at the precise time specified by said synchronizing Internet appliance; and

integrating, by said client, the earliest redirect message it receives into a TCP stream, wherein said client finishes a session with the Web site that sent said earliest redirect message.

17. A method for site selection by routing client request to a optimal server according to claim 11, comprising:

establishing, by said client, TCP connection to a first web site and sending HTTP GET request for a resource from a global domain to a first Internet appliance coupled to said first web site, wherein DNS resolves the domain name to the IP address of said first Internet appliance in said global domain, wherein said global domain is registered in DNS with a unique URL, wherein said first Internet appliance acts as a synchronizing Internet appliance;

sending, by said synchronizing Internet appliance, a pre-built redirect message to every participating Internet appliance, including said synchronizing Internet appliance, wherein said pre-built redirect message's global domain URL is included in its domain portion, wherein said global domain URL is a DNS-registered URL for said global domain;

inserting, by each Internet appliance, its local domain ID into a resource path and sending the redirect message to said client at the precise time specified by said synchronizing Internet appliance.

integrating, by said client, the earliest redirect message it receives into a TCP stream and sending a GET to said global domain URL;

recognizing, by said synchronizing Internet appliance, said local domain ID and redirecting said client to the corresponding local domain URL, wherein said client finishes a session with the Web site that sent said earliest redirect message; and

sending, said synchronizing Internet appliance, the new client network data to other Internet appliances, wherein each Internet appliance updates its Client Network Cache (CNC).

18. A computer network for geographic site selection, comprising:

a Web client sending HTTP a request;

a plurality of geographically distributed Web sites for a Web site domain serving said Web client;

a plurality of Internet appliances, each co-located with one Web site; and

an Internet over which said Web sites and said Internet appliances communicate.

19. The computer network of Claim 18, wherein said Web sites each registered in DNS with a unique name.

20. The computer network of Claim 18, wherein said Internet appliances are configured to participate in a common group representing said computer network as a whole.

21. The computer network of Claim 18, wherein said Internet appliances are entered DNS as said Web site domain.

22. The computer network of Claim 18, wherein each said Internet appliance is configured to redirect said Web client to the unique domain name of co-located Web site.

23. A method of geographic site selection, comprising:

opening TCP connections to other members of a group of Internet appliances by each said Internet appliance and executing a synchronization process among said Internet appliances;

resolving, by a Web client, a Web site domain name to the IP address of a first Internet appliance coupled to a first Web site, wherein DNS responds with said first Internet appliance's IP address;

initiating a TCP connection to said first Internet appliance by said Web client, wherein said first Internet appliance completes TCP handshake and receives an HTTP request by said Web client;

building appropriate HTTP response by said first Internet appliance and tunneling said HTTP response to all other members in said group of Internet appliances, wherein said HTTP response is an HTTP redirect;

modifying said HTTP redirect as appropriate to refer to a domain name being represented by co-locate Web site by each member of said group of Internet appliances, including said first Internet appliance, wherein each member of said group of Internet appliances then initiates said HTTP redirect response to said Web client as if it were said first Internet appliance;

receiving by said Web client the earliest HTTP redirect response from a second Web site which is the optimal Web site to said Web client, wherein said earliest HTTP redirect response from said second Web site is assembled into said TCP stream, wherein said Web client is then redirected to said second Web site that responded to said Web client earliest; and

sending by said Web client all subsequent relative requests directly to said second Web site based on said requests' association to said second Web site's fully qualified domain name.

24. The method of Claim 23, wherein said synchronization process is accomplished by using a network time protocol, wherein said Internet appliances share their time clocks and round trip time with each other by using a TCP connection.

25. The method of Claim 24, wherein said synchronization is continuously updated over said TCP connection based on the rate of change experienced in measuring round trip times.

26. The method of Claim 23, wherein said step of building appropriate HTTP response by said first Internet appliance comprises the step of mapping a fully qualified domain name to a participating group.

27. The method of Claim 23, wherein said HTTP response built by said first Internet appliance includes other information comprising original URL request and synchronization information, wherein said synchronization information ensures that all Internet appliances initiate said HTTP response at the same time.

28. The method of Claim 23, wherein said HTTP response built by said first Internet appliance includes a full IP Header, TCP Header, and HTTP data.

29. The method of Claim 23, further comprising the step of:

constructing said HTTP response that redirects said Web client to the real address of one of said Web sites by said first Internet appliance.

30. The method of Claim 23, further comprising the step of:

altering a domain specific portion of said HTTP response to redirect said Web client to said co-located Web site by said group of Internet appliances.

31. The method of Claim 23, further comprising the step of:

using a unique ID number in an IP header, identical sequence numbers in a TCP header and an identical message length by each member of said group of Internet appliances, to have said first Web site ensure that said Web client processes the multiple responses correctly, wherein said first Web site includes IP, TCP, and the HTTP portion of the response forwarded to each Internet appliance.

32. The method of Claim 23, further comprising the step of:

adding a pad field in said HTTP portion of the response forwarded to each Internet appliance.

33. The method of Claim 23, further comprising the step of:

adding a pad field in the HTTP portion of the response forwarded to each Internet appliance.

34. The method of Claim 23, further comprising the step of:

changing the length of the domain information by adding or deleting pad bytes to maintain the length of said response by said group of Internet appliances.

35. The method of Claim 23, further comprising the step of:

sending said HTTP Redirect response to said Web client based on said synchronization information by said group of Internet appliances.

36. A computer network, comprising:

a Web client sending HTTP a request;

a plurality geographically dispersed main Web sites serving said Web client;

a plurality of smaller Web sites for each main Web site;

a plurality of main Internet appliances, each co-located with one main Web site;

a plurality of Internet appliances, each co-located with one smaller Web site; and

an Internet over which said Web sites and said Internet appliances communicate.

37. The computer network of Claim 36, wherein each said Web site is registered in DNS with a unique name.

38. The computer network of Claim 36, wherein each said main Internet appliance are entered in DNS as said main Web site domain.

39. The computer network of Claim 36, wherein each said main Internet appliance is configured to participate in main group of Internet appliances.

40. The computer network of Claim 36, wherein each said Internet appliance in said main group is configured to redirect said Web client to a fully qualified domain name for the same Internet appliance.

41. The computer network of Claim 36, wherein each said Internet appliance co-located to a smaller Web site within each main Web site is configured to participate in one local group of Internet appliances.

42. The computer network of Claim 36, wherein each said Internet appliance of each local group is configured to redirect said Web client to said unique domain name of co-located Web site.

43. The computer network of Claim 36, wherein each said Internet appliance in said main group also participates in one or more local groups.

44. The computer network of Claim 36, wherein each said Internet appliance may represent one or more fully qualified domain names.

45. A method of geographic site selection by grouping of Internet appliances, comprising the steps of:

resolving Web site domain name to the IP address of one of said main Internet appliances;

initiating a TCP connection by a Web client and receiving an HTTP request by said main Internet appliance;

choosing the optimal main Web site within said main group;

choosing optimal smaller Web sites within said local group for said selected main Web site; and

requesting to selected smaller Web site through direct TCP connection by said Web client.

46. The method of Claim 45, further comprising the steps of:

redirecting said Web client to another fully qualified domain name for the same Internet appliance while choosing the optimal main Web site by said main group Internet appliance.

47. The method of Claim 23, further comprising the steps of:

monitoring the load of co-located Web sites by active probing or by participating in any site load monitoring protocols by said Internet appliance.

48. The method of Claim 23, further comprising the steps of increasing delays of the response by a configurable factor of time by said Internet appliance when the performance of co-located Web site degrades.

49. The method of Claim 23, further comprising the step of:

resuming normal operation of said Internet appliance when performance of co-located Web site increases to an acceptable threshold.

50. The method of Claim 23, further comprising the step of:

stopping participating of redirecting of said Internet appliance when the co-located Web site fails to response.

51. The computer network of Claim 18, wherein a plurality of Internet appliance is placed in each Web site.

52. A computer network for site selection in content routing, comprising:

a Web client sending HTTP a request;

a main site serving said Web client that uses a load switch as load balancer;

a plurality of geographically distributed Web site caches providing static content for said main site;

a main Internet appliance co-located with said main site;

a plurality of distributed Internet appliance, each co-located with one Web site cache; and

an Internet over which said Web sites and said Internet appliances communicate.

53. The computer network of Claim 52, wherein said Internet appliances are configured to participate in a common group representing said network as a whole.

54. The computer network of Claim 52, wherein said Internet appliances are entered in DNS as said Web site domain.

55. The computer network of Claim 52, wherein each said Internet appliance is configured to redirect said Web client to said main site.

56. A method for directing a client to most optimal content in a distributed content environment, comprising the steps of:

communicating, by said client, to a first Web site, which receives client requests, wherein said first Web site maintains TCP connections with all available distributed Web sites,

tunneling, by said first Web site, client packets to a second Web site which is the optimal Web site to said client, wherein said client packets include filtered client requests and any other client traffic for this flow; and

responding, by said second Web site, to said client requests tunneled by said first Web site;

wherein each Web site has at least one Internet appliance; and

wherein client-to-server communications continue to flow to said first Web site and are tunneled to said second site selector, which, in turn, processes tunneled client packets and generates appropriate responses for said client.

57. The method of Claim 56, further comprising the step of:

opening TCP connections to other group members by each Internet appliance; and

executing a synchronization process among said Internet appliances.

58. The method of Claim 56, wherein said step of communicating comprises the sub-steps of:

initiating a TCP connection by said Web client to said first Web site;

sending requests by said client to said first Web site based on said client's relative association to said first Web site's domain name; and

receiving requests by a first Internet appliance coupled to said first Web site.

59. The method of Claim 56, wherein said step of tunneling comprises the sub-steps of:

filtering client requests for content by a filter coupled to said first Internet appliance;

forwarding filtered client requests by said filter to a corresponding address on said first Internet appliance coupled to said first Web site;

determining by said first Internet appliance the optimal Web site to said client based on each Web site's response time to said client; and

sending client packets by said first site selector to a second site selector coupled to a second Web site which is the optimal Web site to said client.

60. The method of Claim 56, wherein said filter is a URL switch, responsible for filtering URL requests from said client based on the content that said client is requesting and directing said requests to specific IP addresses and port numbers on said first site selector with which said switch co-locates.

61. The method of Claim 59, wherein said sub-step of filtering client requests for content may be performed by said first site selector which is extended to perform URL scanning.

62. The method of Claim 56, wherein the step of responding comprises the sub-steps of:

receiving, by said second site selector, said client packets;

retrieving, by said second site selector, the embedded URL from a configured location coupled to said second site selector; and

responding, by said second site selector, to said client as a lightweight proxy for said first site selector, wherein said second Web site sends content packets to said client as if it were said first Web site.

63. The method of Claim 56, wherein said distributed content environment includes Web caches or other non-collocated server devices.

64. The method of Claim 56, further comprising the step of:

determining the group of distributed Internet appliances for said client requests by the IP/Port combination on which said first Internet appliance receives said client requests.

65. The method of Claim 56, further comprising the step of:

choosing a distributed Internet appliance based on URL request from said Web client.

66. The method of Claim 56, further comprising the step of:

choosing a distributed Internet appliance based on the IP address of said Web client.

67. The method of Claim 56, further comprising the step of:

assigning a most available distributed Internet appliance to said Web client for a configurable time.

68. The method of Claim 56, further comprising the step of:

removing any association of said Web client with a distributed Internet appliance by said first Internet appliance in the event of a failure of a distributed Internet appliance.

69. The method of Claim 56, further comprising the step of:

determining new optimal distributed Internet appliance to said client when any association of said Web client to a distributed Internet appliance is removed.